



**APPENDIX II**  
**CLEAN VERSION OF THE ENTIRE SET OF PENDING CLAIMS**  
**PURSUANT TO 37 CFR § 1.121 (c)(3)**

1. (Twice Amended) A device comprising:
  - i) a microdroplet transport channel in a silicon substrate, said channel connecting to a reaction region; and
  - ii) a series of heating elements arrayed along said microdroplet transport channel, wherein said series of heating elements are configured so as to provide differential heating.
2. The device of Claim 1, wherein said heating elements are comprised of aluminum.
3. The device of Claim 1, wherein said transport channel is treated with a hydrophilicity-enhancing compound.
4. The device of Claim 1, wherein said substrate comprises silicon.
5. (Amended) The device of Claim 1, wherein said microdroplet transport channel further comprises a first silicon oxide layer, a silicon nitride layer, and a second silicon oxide layer.
6. The device of Claim 1, further comprising a second microdroplet transport channel in said substrate.
7. The device of Claim 6, wherein said first and second transport channels are etched in said substrate.
8. (Twice Amended) A system comprising:
  - i) a microdroplet;
  - ii) first and second microdroplet transport channels in a silicon substrate, said channels connecting to a reaction region; and

- iii) a series of heating elements arrayed along said first and second transport channels, wherein said series of heating elements are configured so as to provide differential heating of said microdroplet by said heating elements.

9. The system of Claim 8, wherein said microdroplet comprises organic material.

10. The system of Claim 9, wherein said organic material is selected from the group consisting of proteins, lipids, and nucleic acids.

11. The system of Claim 8, wherein said first and second transport channels are etched in said substrate.

12. The system of Claim 11, wherein said substrate comprises silicon.

13. (Amended) A device comprising:

- i) a first housing portion comprising silicon;
- ii) a microdroplet transport channel in said first housing portion, said transport channel connecting to a reaction region;
- iii) a second housing portion bonded to and aligned with said first housing portion thus creating an assembled housing, wherein said second housing portion is selected from the group consisting of silicon, quartz or glass; and
- iv) a series of heating elements in said assembled housing arrayed along said fluid transport channel, wherein said series of heating elements are configured so as to provide differential heating.

14. The device of Claim 13, wherein said heating elements are comprised of aluminum.

15. The device of Claim 13, wherein said transport channel is treated with a hydrophilicity-enhancing compound.



16. The device of Claim 13, wherein said transport channel comprises silicon.
17. The device of Claim 16, wherein said transport channel further comprises a first silicon oxide layer, a silicon nitride layer, and a second silicon oxide layer.
18. The device of Claim 13, further comprising a second microdroplet transport channel in said first housing.
19. The device of Claim 13, further comprising a second series of heating elements arrayed along said second transport channel.
20. The device of Claim 13, wherein said first and second transport channels are etched in said first housing.